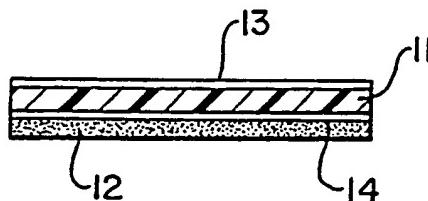




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : B32B 7/06, 33/00, C09J 7/02	A1	(11) International Publication Number: WO 92/19447 (43) International Publication Date: 12 November 1992 (12.11.92)
(21) International Application Number: PCT/US92/03557 (22) International Filing Date: 24 April 1992 (24.04.92)		Published <i>With international search report.</i>
(30) Priority data: 695,204 3 May 1991 (03.05.91) US		
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(81) Designated States: AT (European patent), BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, KR, LU (European patent), MC (European patent), NL (European patent), SE (European patent).		

(54) Title: ADHESIVELY COATED, DIFFERENTIAL RELEASE TAPE FOR APPLYING ADHESIVE TO A SUBSTRATE



(57) Abstract

An adhesively-coated, differential release adhesive applicator tape is disclosed. A carrier strip (11) is coated on one side with pressure sensitive adhesive (12). The surface of the carrier strip (11), to which the adhesive (12) is bonded, has release characteristics therewith of "intermediate" effectiveness. When the tape is applied to a typical substrate, such as paper, the bond of the adhesive to the substrate is greater than the bond of the adhesive to the release surface (14) of the carrier strip. Accordingly, the carrier strip can be peeled away, leaving the exposed adhesive surface on the substrate. The uncoated surface (13) of the carrier strip is of a material having a highly effective level of release characteristic with the pressure sensitive adhesive (12), so that the adhesively coated carrier tape may be packaged in a roll and the tape can thus easily be peeled off of the roll without removing adhesive from the coated side of the carrier strip.

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**ADHESIVELY COATED, DIFFERENTIAL RELEASE TAPE
FOR APPLYING ADHESIVE TO A SUBSTRATE**

Background and Summary of the Invention

The present invention is directed to a novel
5 applicator tape useful for applying adhesive to a base sub-
strate.

A variety of applications exist for the applica-
tion of an adhesive to a base substrate, enabling another
object to be adhered to the substrate. One product pres-
10 ently available for this purpose is a pressure sensitive
plastic carrier tape, which is provided with adhesive on
both surfaces. A length of the double coated tape is
applied to a base substrate in such a way that one of the
adhesive-coated surfaces of the tape is bonded to the base
15 substrate, and the opposite adhesive-coated surface of the
tape is exposed for adhering another object. While this
product performs at a certain level, it has significant
disadvantages. Among these is the fact that, since the
tape is coated on both sides with pressure sensitive
20 adhesive, it is very difficult to handle as there is no
place to touch the tape without its sticking to the user's
hands. Additionally, the carrier tape is necessarily
present in the ultimate combination of substrate, adhesive
and attached object, even though it is an unwanted element.

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Another currently available product is a tape of foam-like material coated on both sides with pressure sensitive adhesive and wound with a release paper separately attached to one surface. This tape can be dispensed and 5 handled with the release paper in place, and the release paper subsequently removed to expose an adhesive surface. The last mentioned product, while somewhat more convenient to handle, is costly and still results in the presence of a tape strip between two objects to be adhesively joined.

10 Pursuant to the present invention, a novel and improved arrangement is provided for enabling an adhesive to be applied to a base substrate, while eliminating the presence of the customary intervening carrier tape. In the product of the present invention, a temporary carrier strip 15 is provided, which is coated on one surface only with a pressure sensitive adhesive and which has release characteristics, relative to the pressure sensitive adhesive, on both its adhesively coated and its uncoated surfaces. On its uncoated surface, the carrier strip has a highly 20 effective release characteristic relative to the adhesive, so that the pressure sensitive adhesive has little or no adhesive bonding with the uncoated surface of the carrier strip. The adhesively coated surface of the carrier strip also has an effective release characteristic with respect 25 to the pressure sensitive adhesive, but, according to the

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invention, the release characteristic of the coated surface is less effective than the release characteristic of the uncoated surface. The tape can thus be prepared and formed into a roll in the usual manner. When being dispensed from 5 a roll, the adhesively coated carrier strip freely peels from the roll, because the exposed pressure sensitive adhesive easily releases from the uncoated or back side of the carrier strip.

An adhesive may be applied to a paper substrate, 10 for example, by dispensing a short length of the coated carrier strip and applying the adhesively coated side of the strip to the paper substrate. The carrier strip is then peeled away from the underlying substrate. The pressure sensitive adhesive, having a release bond with the 15 carrier strip, remains adhesively bonded to the paper substrate as the carrier is peeled away. When the carrier strip is fully removed, an exposed surface of the pressure sensitive adhesive remains on the base substrate, enabling attachment of another object thereto. The manual operations required are easily carried out, because the carrier 20 strip has no adhesive on its uncoated side. Moreover, upon completion of the operation, the carrier strip is no longer present and an external object can be bonded directly to the base substrate via the deposited layer of pressure 25 sensitive adhesive.

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If desired, the carrier strip may be temporarily left in place, bound to the base substrate by its release bond characteristic to the pressure sensitive adhesive. The adhesive is thus kept clean and protected until it is 5 desired to use it by peeling away the covering carrier strip.

For certain applications, it may be desired to apply pressure sensitive adhesive to the carrier strip in a series of short segments, interrupted by short intervening uncoated spaces. When dispensing a length of tape, the 10 tape can be severed in an uncoated area, leaving a short uncoated tab end, to facilitate gripping of the carrier strip to effect its removal. Likewise, side margins of the carrier strip may be left free of adhesive to facilitate 15 removal of the strip.

For a more complete understanding of the above and other features and advantages of the invention, reference should be made to the following detailed description of a preferred embodiment and to the accompanying drawings.

20 Description of the Drawings

Fig. 1 is a representative elevational view of a roll of adhesively coated, differential release tape according to the invention.

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Fig. 2 is a simplified representation, illustrating the tape of the invention as applied to a base substrate, showing the differential release carrier tape being removed therefrom, leaving the pressure sensitive adhesive.

Fig. 3 is an enlarged cross sectional representation of a possible form of differential release carrier tape, coated on one side with pressure sensitive adhesive, according to the principles of the invention.

10 Figs. 4 and 5 are plan views of a section of interruptedly coated carrier tape according to one aspect of the invention.

Fig. 6 is a cross sectional view of a further modified form of the invention.

15 Description of Preferred Embodiments

Referring now to the drawing, the reference numeral 10 designates generally a continuous roll of adhesively-coated, differential release applicator tape according to the invention. A new tape includes a carrier 20 strip 11, which is coated on one side only with a pressure sensitive adhesive 12. With particular reference to Fig. 3, the carrier strip 11 has an outer surface 13 and an

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inner surface 14. The pressure sensitive adhesive 12 is coated over the inner surface 14.

Pursuant to the invention, the inner and outer surfaces 13, 14 are formed of materials having release characteristics relative to the pressure sensitive adhesive 12. This description refers to the fact that there is only limited bonding between the pressure sensitive adhesive material 12 and the surface material 14, and between the pressure sensitive adhesive 12 and the surface material 13.

10 al 13.

In accordance with one aspect of the invention, the pressure sensitive adhesive material 12, the lower (adhesively coated) surface material 14, and the upper (uncoated) surface material 13 all are selected so as to present controlled, differential release characteristics. To this end, there should be minimal bonding (maximum release effectiveness) between the pressure sensitive adhesive and the material of the outer (uncoated) surface 13 so that, when there is contact between the adhesive 12 and the uncoated release surface 13, the materials are easily separated without significant residual adherence. The characteristics of the release material 14 are chosen to be such, in relation to the selected pressure sensitive adhesive 12, as to provide a greater degree of bonding (intermediate release effectiveness) between the

25

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adhesive 12 and the release material of the surface 14 than between the adhesive material and the release materials of the outer surface 13.

As will be appreciated, the structure described 5 in Fig. 3 enables a continuous strip of the differential release, adhesively coated tape 10 to be wound in a conventional, easily-handled roll 15, as shown in Fig. 1. When a length of tape 10 is peeled off of the roll, the pressure sensitive adhesive 12 freely releases from the outer 10 release surface 13, while staying bonded to the surface 14.

Pursuant to the invention, the release bond between the pressure sensitive adhesive 12 and a conventional substrate 16 (Fig. 2), such as sheet of paper, is significantly greater (minimum release effectiveness) than 15 the bond between the adhesive 12 and the adhesive-coated release surface 14. Accordingly, when a section of tape 10 is applied to a base substrate 16, the carrier strip 11 can be peeled off, leaving an intact layer of the adhesive 12 bonded to the base substrate 16. The outer surface of the 20 adhesive is then fully exposed and ready to be bonded to another surface or object.

In the specific illustration of Fig. 3, the differential release surfaces 13, 14 are shown as distinct layers. In this respect, the release materials may be

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applied to a core material by way of co-extrusion or by coating, for example. Likewise, one of the surfaces may be an uncoated surface of the core material, and the other may be applied by co-extrusion, coating or the like to have
5 different release characteristics. The particular production technique is not significant, as long as the end result, of providing a carrier strip whose opposite surfaces have differential release characteristics in relation to the selected pressure sensitive adhesive, is achieved.

10 In an advantageous modification of the invention, shown in Fig. 4, pressure sensitive adhesive 112 is applied to a carrier strip 111 in interrupted areas, which may or may not extend across the full width of the carrier strip, but at least are spaced apart longitudinally of the
15 strip, to form uncoated spaces 117. This arrangement has certain advantages when utilizing short lengths of tape drawn from a dispenser, for example, as it enables the tape to be severed in the uncoated spaces 117. When the adhesive area is subsequently applied to a base substrate,
20 portions of the tape at one or both ends are unbonded to the base substrate and are quite easily accessible to the fingers, to facilitate peeling off of the carrier tape to expose the adhesive.

Fig. 5 illustrates a modification, similar to
25 that of Fig. 4, in which adhesive 212 is applied to the

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carrier strip 311 in relatively narrow strips, perhaps narrower in the longitudinal direction than the transverse, with intervening uncoated spaces 217. Using a series of short (longitudinally) coated spaces with intervening short
5 uncoated spaces facilitates handling of the tape.

As reflected in Fig. 6, the adhesive area 312, whether longitudinally continuous, or discontinuous as shown in Figs. 4 and 5, may extend across less than the full width of the carrier strip 311. This provides an
10 uncoated margin 313, which extends continuously for the full length of the carrier strip. Thus, under all conditions, an unadhered end corner area is available, after application of the adhesively coated carrier strip to a substrate. This facilitates subsequent removal of the
15 carrier strip 311, as will be appreciated. The adhesively coated area 312 may be centered with respect to the side edges of the carrier strip 311, or may be offset toward one of the edges, as indicated in broken lines in Fig. 6.

The product of the invention can be used in an
20 extremely wide variety of ways. One of the common usages is simply to lay down a band of pressure sensitive adhesive on a base substrate, to which it is desired to adhere another element. This would encompass, for example, most of the known usages of the commercially available tape,
25 which is coated on both sides with pressure sensitive

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adhesive. The product of the invention, however, is significantly more advantageous in that it is far easier to handle and, in the end, does not leave in place a layer of carrier strip interposed between the base substrate and the 5 object adhered to it.

The product of the invention, notwithstanding its significant advantages, may be inexpensively produced. The provision of release surfaces is well-known technology, which can be easily matched to a given, desired pressure 10 sensitive adhesive. In most cases, the carrier strip itself can serve as one of the differential release surfaces, while the opposite side of the strip is provided (e.g., by coating or co-extrusion) with a surface providing the desired differential release characteristics.

15 It should be understood, of course, that the specific form of the invention herein illustrated and described is intended to be representative only, as certain changes may be made therein without departing from the clear teachings of the disclosure. Accordingly, reference 20 should be made to the following appended claims in determining the full scope of the invention.

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1 1. An adhesively coated, differential release applicator
2 tape for applying pressure sensitive adhesive to a base
3 substrate, which comprises
4 (a) a carrier strip having opposite side surfaces,
5 (b) first and second release materials on the respective
6 ones of said opposite side surfaces of said carrier strip,
7 (c) a separable coating of pressure sensitive adhesive on
8 said first release material,
9 (d) said second release material having a greater release
10 effectiveness, relative to said adhesive, than said first
11 release material, enabling a first section of adhesively
12 coated carrier strip, adhesively contacting the second
13 release material of a second section of carrier strip, to
14 be readily separated from said second section while adhe-
15 sive coating remains adhered to said first release materi-
16 al,
17 (e) said first release material having a greater release
18 effectiveness, relative to said adhesive, than said base
19 substrate whereby, when said adhesively coated carrier
20 strip is applied to said base substrate, said carrier strip
21 may be removed, separating from said adhesive and leaving
22 an exposed adhesive area on said base substrate.

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1 2. An applicator tape according to claim 1, further
2 characterized by
3 (a) one of said release materials comprising material of
4 said carrier strip, and the other of said release materials
5 comprising a separate material applied to a surface of said
6 carrier strip.

1 3. An applicator tape according to claim 1, further
2 characterized by
3 (a) said applicator tape being wound in a tight roll,
4 with its adhesively coated surface in contact with the
5 opposite surface of said carrier strip.

1 4. An applicator tape according to claim 1, further
2 characterized by
3 (a) said coating of adhesive being of less width than
4 said carrier strip to provide a continuous margin, along
5 one or both edges of the carrier strip, free of adhesive.

1 5. An applicator tape according to claim 1, further
2 characterized by
3 (a) said coating of adhesive being applied in a longitudinally discontinuous manner to said carrier strip.

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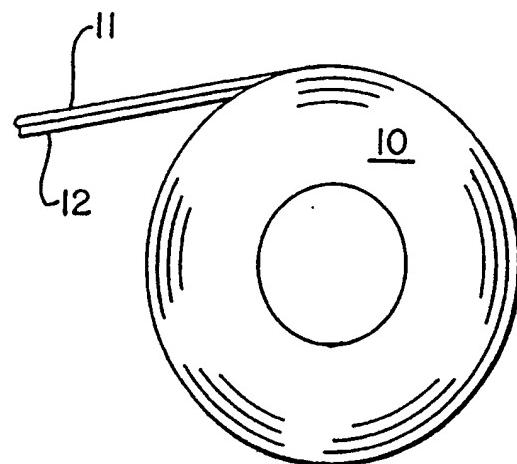


FIG. 1

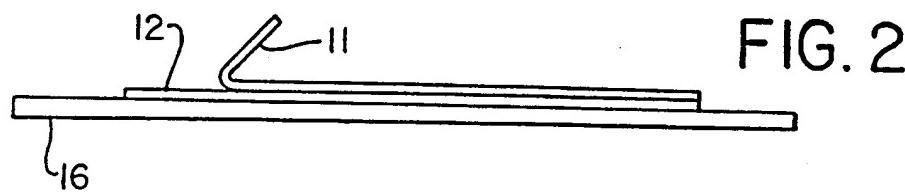


FIG. 2

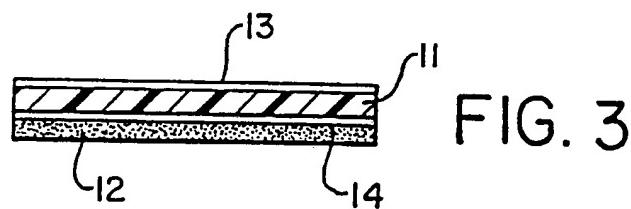


FIG. 3

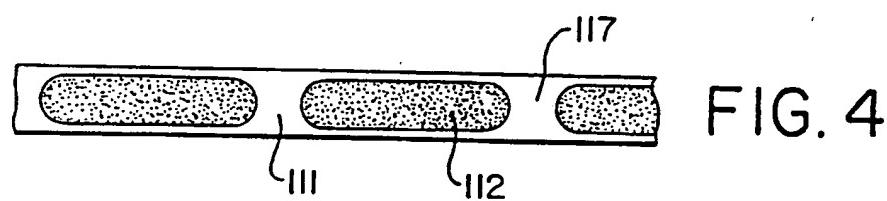


FIG. 4

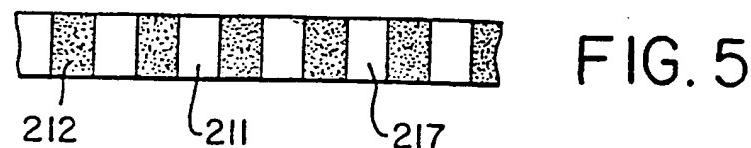
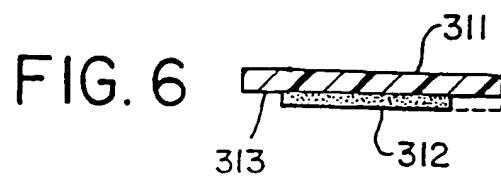


FIG. 5



SUBSTITUTE SHEET

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US92/03557

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :B32B 7/06, 33/00; C09J 7/02
 US CL :428/40, 343, 352, 354

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 428/40, 343, 352, 354

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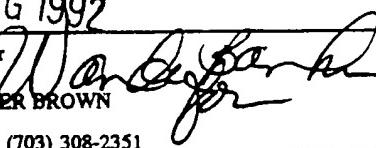
C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A, 4,728,380 (JONES ET AL) 01 March 1988, Entire document.	1-5

Further documents are listed in the continuation of Box C. See patent family annex.

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